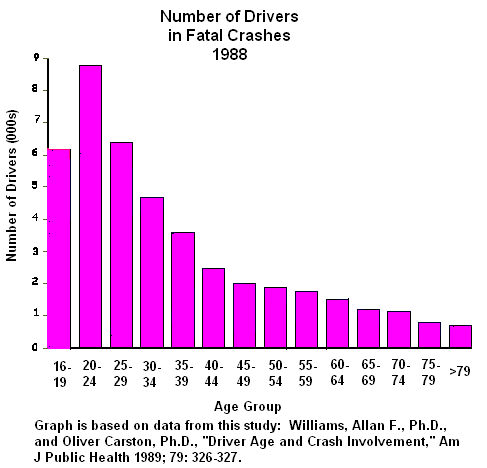
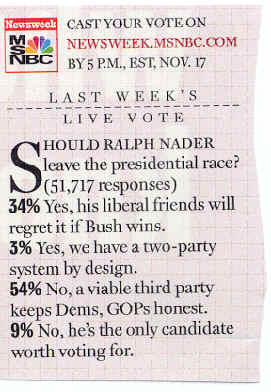
Public Statement in Scientific light worksheet

1.  The following statistics suggest that 16-year-olds are safer drivers than people in their twenties, and that octogenarians are very safe.  Is this true?



2.  On November 13, 2000, Newsweek published the following poll results:



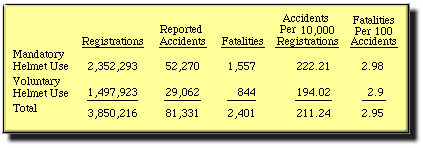
Since 9% said that Nader was the only candidate worth voting for, one would have expected him to get at least 9% of the vote in the 2000 election. He only got about 3%. What happened?

3.  Consider these complaints about airlines published in US News and World Report on February 5, 2001:



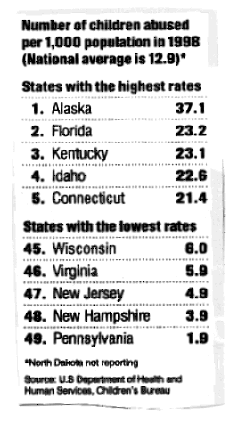
Can we conclude that United, American, and Delta are the worst airlines and Alaska, Southwest, and Continental are the best?

4.  The following statistics about motorcycle helmet use seem to suggest that helmets cause more injuries and fatalities.  Is it really safer to go without helmets?



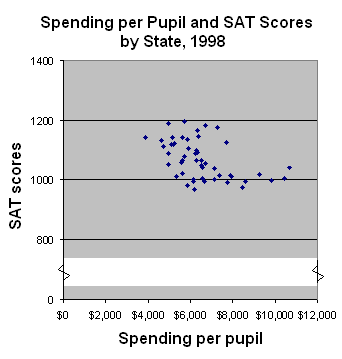
Source:   Motorcycle Statistical Annual, Motorcycle Industry Council, Inc., 1994, as reported on http://www.bikersrights.com/statistics/stats.html.

5.  This clipping from US News and World Report on 1/29/01 suggests that Alaskans are terrible parents.  Is this true?

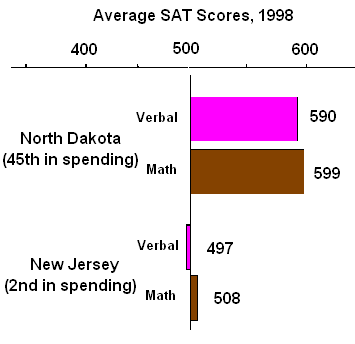


6.  Columnist George Will wrote in the Washington Post in 1993 that  "... the 10 states with the lowest per pupil spending included four — North Dakota, South Dakota, Tennessee, Utah — among the 10 states with the top SAT scores ... New Jersey has the highest per pupil expenditures, an astonishing $10,561… [Its] rank regarding SAT scores? Thirty-ninth."

This negative correlation between spending per pupil and SAT performance seems to be borne out by this graph:



And by this one:



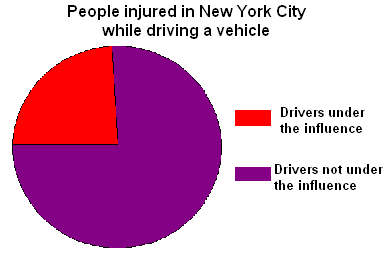
Does this mean that spending more on education makes students worse off?

7.   Researchers (Arthur Kellermann et. al., "Gun Ownership as a Risk Factor for Homicide in the Home," The New England Journal of Medicine, October 7, 1993, pp. 1084-1091), found that gun owners are 2.7 times more likely to be murdered than non-owners.  Does this mean it's safer to not have guns in the house?

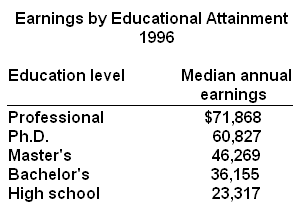
8.  "The best public schools offer a more challenging curriculum than most private schools."  Are public schools therefore better than private schools?

9.  "Fluoride consumption by human beings increases the general cancer death rate.   ….  [P]eople in fluoridated areas have a higher cancer death rate than those in non-fluoridated areas."  Should fluoridation be prohibited?

10.  Can we conclude from the following diagram that it's safer to drive while under the influence?



11.  The [Monthly Labor Review](http://www.bls.gov/opub/ted/1998/Oct/wk3/art05.htm) published the following data, showing how earnings vary with education:



Can we conclude that getting a bachelor's degree will increase your earnings by almost $13,000 a year?

12.  Allen Hershkowitz, senior scientist with the Natural Resources Defense Council, wrote that "a  well-run curbside recycling program can cost anywhere from $50 to more than $150 per ton of materials collected. Typical trash collection and disposal programs, on the other hand, cost anywhere from $70 to more than $200 per ton."  Does recycling save money?

Truth About Nature of Science

|  |  |
| --- | --- |
| **1.** | **Scientists usually expect an experiment to turn out a certain way.** |
| **2.** | **Science only produces tentative conclusions that can change.** |
| **3.** | **Science has one uniform way of conducting research called “the scientific method.”** |
| **4.** | **Scientific theories are explanations and not facts.** |
| **5.** | **When being scientific one must have faith only in what is justified by empirical evidence.** |
| **6.** | **Science is just about the facts, not human interpretations of them.** |
| **7.** | **To be scientific one must conduct experiments.** |
| **8.** | **Scientific theories only change when new information becomes available.** |
| **9.** | **Scientists manipulate their experiments to produce particular results.** |
| **10.** | **Science proves facts true in a way that is definitive and final.** |
| **11.** | **An experiment can prove a theory true.** |
| **12.** | **Science is partly based on beliefs, assumptions, and the nonobservable.** |
| **13.** | **Imagination and creativity are used in all stages of scientific investigations.** |
| **14.** | **Scientific theories are just ideas about how something works.** |
| **15.** | **A scientific law is a theory that has been extensively and thoroughly confirmed.** |
| **16.** | **Scientists’ education, background, opinions, disciplinary focus, and basic guiding assumptions and philosophies influence their perception and interpretation of the available data.** |
| **17.** | **A scientific law will not change because it has been proven true.** |
| **18.** | **An accepted scientific theory is an hypothesis that has been confirmed by considerable evidence and has endured all attempts to disprove it.** |
| **19.** | **A scientific law describes relationships among observable phenomena but does not explain them.** |
| **20.** | **Science relies on deduction (x entails y) more than induction (x implies y).** |
| **21.** | **Scientists invent explanations, models or theoretical entities.** |
| **22.** | **Scientists construct theories to guide further research.** |
| **23.** | **Scientists accept the existence of theoretical entities that have never been directly observed.** |
| **24.** | **Scientific laws are absolute or certain.** |

**Science Literacy: Building a Better World**

**Student Handout 2**

**1. Science Activist** Write a letter to a member of government in your country that clearly states and supports your opinion on whether it is important for industrialized nations to support science literacy programs in developing nations. You will need to determine an appropriate person in government and find the correct mailing address. In the letter, explain why this person was selected to receive your comments. The letter should be polite and well written.

**2. Class Project: Adopt-a-School**

Group 1

Brainstorm about why science literacy is important for everyone. Have someone take notes during the brainstorming session. To complete the activity:

! review the notes and rewrite ideas into one-liners, e.g., *to understand why species are in danger*

! create a flyer listing the one-liners

Group 2

Collect magazines or articles about biodiversity, the environment, and conservation. Review the material to verify that it is scientifically sound. Ask the teacher to review your collection.

Group 3

Choose a developing nation. Find a listing of high schools in that nation on the Internet. Make contact with a school and inform its science department that you would like to send a package. Send the flyer and magazine/article collection to the school.

*Variations*

! translate the flyer into the language of the developing nation you have chosen

! publish the flyer and/or articles (with reprint permission) on your school’s web site and inform the schools you have chosen that these materials are available for their use

**3. Earth Day** Choose a developing region of the world and find out on the Internet about its conservation problems and efforts to solve these problems. Design a pamphlet or flyer for a display that would suit Earth Day activities in your community.

Source: http://www.actionbioscience.org/newfrontiers/delarosa.html 4 of 5 Lesson: *Science Literacy: Building a Better World* by Kim Burley ©2002